CLAIMS

What is claimed is:

1. In a computer network having a plurality of network nodes, a method for caching data within the network node comprising the steps of:

receiving data packets incoming from said network;

storing said data packets in a first cache until a predetermined amount of data is received;

transferring said predetermined amount of data in said first cache to a main memory in a single memory operation; and

transferring said predetermined amount of data from said main memory to a second cache in a single memory operation.

2. The method of Claim 1 further comprising the step of forwarding data packets out of said network node from said second cache onto said network.

3. The method of Claim 1, wherein said predetermined amount of data is comprised of N blocks of data and the size of said block corresponds to a minimum data packet size.

4. The method of Claim 1 wherein said first cache, said main memory, and said second cache act logically as a single first-in-first-out queue.

5. The method of Claim 1, wherein said data incoming to said memory is comprised of M data flows and said network node is comprised of M multiple first caches, M multiple data storage areas within said main memory buffer, and M multiple second caches.

6. The method of Claim 1, wherein the first cache, the main memory, and the second cache are comprised of random access memory.

7. The method of Claim 6, wherein the first cache is comprised of SRAM, the main memory is comprised of DRAM, and the second cache is comprised of SRAM.

8. The method of Claim 1 further comprising the step of transferring data directly from the first cache to the second cache and bypassing the main memory.

9. A network element for coupling to a data network, comprising:

a first cache which stores data received by the network element;

a main memory coupled to the first cache, wherein data from the first cache is written to the main memory;

a second cache coupled to the main memory, wherein data from the main memory is written to the second cache for output onto the network.

10. The network element of Claim 9 wherein said first cache stores N blocks of data until a given set of N blocks of data are stored whereupon the given set of N blocks of data are transferred to the main memory in a single memory access operation.

11. The network element of Claim 10, wherein the given set of N blocks of data stored in the main memory are transferred to the second cache in a single memory access operation.

12. The network element of Claim 11 further comprising a plurality of first caches, a plurality of separate storage areas in said main memory, and a plurality of second caches.

13. The network element of Claim 9, wherein said first cache comprises SRAM, said main memory comprises DRAM, and said second cache comprises SRAM.

14. The network element of Claim 9, wherein said second cache may request data be transferred directly from the first cache.